

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 13358-5 (1993): Codes of Practice for cultivation of aromatic plants, Part 5: piperita (Peppermint) and Mentha spicata (Spearmint) [PCD 18: Natural and Synthetic Fragrance Materials]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



IS 13358 (Part 5) : 1993

(Reaffirmed 2000)

भारतीय मानक

सुगन्धित पौधों की खेती — रीति संहिता

भाग 5 मेन्था पिपरेटा और मेन्था स्पाईकेटा

Indian Standard

CODE OF PRACTICE FOR CULTIVATION OF
AROMATIC PLANTS

PART 5 MENTHA PIPERITA (PEPPERMINT) AND MENTHA SPICATA (SPEARMINT)

UDC 665.526.22

© BIS 1993

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

August 1993

Price Group 1

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Natural & Synthetic Perfumery Materials Sectional Committee, had been approved by the Petroleum, Coal and Related Products Division Council.

Natural perfumery materials like essential oils, are known to vary in olfactory and other physico-chemical characteristics depending on different agro-climatic conditions. Working on this premise, the Committee had quite some time back published IS 6774 : 1972 Classification of essential oil bearing aromatic plants¹. This standard covers information relating to botanical identity, habitat, economic stage of growth, harvesting season and part of the plant used for essential oil production. These factors have long been recognized to govern the quality of the natural essential oils.

Realizing the importance of endemic variations of these factors including fertilizer, irrigation, modern technology and appropriate agronomic practices developed through a process of evaluation trials at recognized cultivation centres for aromatic plants in the country, the Committee decided to amplify these efforts directionally and prepare specific codes for good cultivation practice for individual aromatic plants used for essential oil production. This series of Indian Standards for specific aromatic plants is expected to provide guidance to prospective cultivators, producers and users of the essential oils to obtain the optimum yield of the essential oil of an acceptable quality for the perfumery industry.

In the preparation of this standard, assistance has been derived from R & D work of ICAR and CSIR laboratories besides State Directorates and Institutions for Medicinal Plants.

Indian Standard

CODE OF PRACTICE FOR CULTIVATION OF AROMATIC PLANTS

PART 5 MENTHA PIPERITA (PEPPERMINT) AND MENTHA SPICATA (SPEARMINT)

1 SCOPE

This standard prescribes a code of practice for cultivation of the aromatic plants for production of oil of peppermint, botanically known as *Mentha piperita* Linn. and spearmint botanically known as *Mentha spicata* Linn., introduced mainly from Europe and USA where these are extensively cultivated. The oil of peppermint is cooling, sweet in taste and possess 45 to 50 percent menthol, whereas the spearmint oil has 59 to 62 percent l-carvone, emitting warm, fruity spicy aroma. These crops grow in U.P. and parts of Punjab and their respective oil is now being exported to Europe/USA.

2 VARIETIES AND CULTIVARS

Mentha piperita

Black Mitchen (var. *vulgaris* Linn.) a hardy introduced culture is generally grown in India. It contains higher oil content. Another culture called white mint (var. *officinalis* Linn.) has low oil content, is less hardy but is reported to yield superior odour value of oil. A number of clonal material and selections of black Mitchen occur into cultivation in India.

Mentha spicata

Similarly common spearmint culture with thick broad foliage and pink stems continue to be popular in the cultivation. Lately, some selections have also been brought out and introduced into cultivation.

3 SOIL AND CLIMATE

These species favour cooler temperature, climate of foot-hills and longer days (more sun light) for higher growth and yield, though organic well drained soils with pH ranging 6 to 8 is ideal, other conditions remaining same as described.

4 PROPAGATION AND PLANTING

Live juicy stolons of Mitchenmint and spearmint are planted in February (foot-hills & plains) to March and April (hills) in well prepared fields (or terraced lands) in rows. These stolons 5 to 8 cm in size are planted in furrows at 2 cm depth at 40 to 45 cm spacing in rows either end to end or 10 cm distance in the row and given a light irrigation. It sprouts in 10 to 21 days and grow into erect healthy shoots.

5 MANURES AND FERTILIZERS

Generally nitrogeenous, phosphatic and potash fertilizer in 100:40:20 kg/ha ratio is given. About 1/6 of total nitrogen, along with entire quantity of phosphatic and potash fertilizers is applied at planting whereas the remaining nitrogen is divided into two equal splits and given as top dressing in moist soil in April and July months when the plants are 8 to 12 cm high. The fertilizers optimize growth and increase yield significantly showing it has influence on oil content or oil quality produced.

6 WEEDING AND INTER-CULTURE

These mints maintain rows before the first harvest is taken and allow wheel hoe, tractor-tillers, bullock drawn interculture and hand hoes, used in rows in early growth stage. Usually two weeding cum hoeings are given before the first crop is harvested in mid-June. The crop sprouts in a fortnight and spread all over the field during rainy season, forming thick growth. Incessant rains (because of high soil moisture & thick growth) limit mechanized interculture. Only two or three hand weedings are possible. Pre-emergent use of chemical weedicides like Sinbar (Terbacil) at 1.5 kg in 805 litres of water/ha is recommended to control weed growth.

7 IRRIGATION

The crops needs copious irrigation three to four times each month in summer months of April to June before the first harvest is taken. Since monsoon continue in most part of July — August and September the fields needs a suitable network of drainage system. The crop is given irrigation if rains are erratic to maintain soil moisture till second harvest is taken.

8 HARVESTING AND YIELD

The oil content in these two mint crops is low (0.3 to 0.35 percent on fresh weight basis). The stage of harvest in mint plays a crucial role in its quality and odour value. Immature peppermint produce oil with less sweet aroma. The optimum harvesting time is determined by crushing foliage between two fingers when it emits characteristic minty odour and confirmed, by test distillation. Falling of lower leaves in an otherwise well grown branched stem full of foliage gives indication of approaching maturity

of the crops where flowering is scattered in spearmint but is shy or absent in piperita species. The first cutting is taken in second to fourth week of May and the second in July/August.

Total harvests yield varies from 4 to 6 tons producing 60 to 80 kg of oil per hectare of peppermint and spearmint depending upon soil fertility, crop strand, growth and management. The oil of peppermint has 35-40 percent menthol, 25-30 percent methone (calculated as menthol) and 3-4 percent menthyl acetate.

9 DISTILLATION

Usual steam or water steam (hydro) distillation is used and the crop is distilled in 90 minutes. The peppermint oil is yellow, mobile liquid. cooling to senses and sweet in taste with 40 to 50 percent of menthol. Presence of moisture in stored mint be avoided as it oxidizes or resinify the oil and spoil it. The mint oils are slightly acidic in nature and galvanized steel drums are used for storage.

10 DISEASES AND PESTS

Stolen rot caused by *Macrophomina phaseoli* (Maubl) Hobby sometimes occur in both of these species causing loss of crop strand in early stages. The infected stems show brown lesions, turning black and later results into soft decay. This causes yellowing of leaves, stunted growth and wilting. The stems be treated with 0.1 percent solution of suitable pesticide before planting. Once disease occur, the infected plants be segregated, pulled and burnt.

Spearmint is susceptible to blight in Himachal Pradesh. Leaf blight is caused by *Alternaria* spp. which is another disease known for sizeable losses for some years in India. It forms oval brown spots which coalesce and become bigger. Spraying of copper fungicides like cuprous oxide and copper oxychloride in early stages of infection, control the disease.

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards Monthly Additions'. Comments on this Indian Standard may be sent to BIS giving the following reference :

Doc : No. PCD 18 (1155)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices :

	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	{ 331 01 31 331 13 75
Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	{ 37 84 99, 37 85 61 37 86 26, 37 86 62
Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036	{ 53 38 43, 53 16 40 53 23 84
Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113	{ 235 02 16, 235 04 42 235 15 19, 235 23 15
Western : Manakalaya, E9 MIDC, Marol, Andheri (East) BOMBAY 400093	{ 632 92 95, 632 78 58 632 78 91 632 78 92
Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. PATNA. THIRUVANANTHAPURAM.	